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Field Crops
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Amended Varietal Description of CDC Richard Hull-less Two-Row Spring Barley

Origin and breeding

CDC Richard, tested as TR307 and SB85219, is a hull-less two-row feed barley developed at the Crop Development Center, University of Saskatchewan. It was derived from the cross SB80211 x WPG M797-84 made in 1982. A modified pedigree selection system using in the F_2 generation a space-planted field nursery, single seed descent in a greenhouse for the F_3 and F_4 generations, single row field nursery in the F_5 generation and yield tests for the F_6 and F_9 generations was used in developing this variety. The selection criteria were yield, maturity, resistance to scald, rust and spot-form net blotch, ease of threshing, test weight, kernel size and acid extract viscosity. Breeder seed was derived from 182 F_9 lines and was first bulked in 1989.

Varietal characteristics

Plant characteristics

Coloptile color: green

Juvenile growth: erect

Leaves: medium green; medium length and width; green glabrous sheath; glabrous blade

Flag leaf: medium green; medium length and width; intermediate attitude; slightly waxy sheath; white auricles

Stem: grass green; slightly waxy; medium thickness; 4 to 5 nodes; close, tending to v-shaped collar; straight neck; 0 to 3 cm exsertion

Plant height: medium, slightly shorter than Scout and slightly taller than Abee

Heading date: mid-season

Maturity: slightly earlier than Abee and later than Scout

Tolerance to drought: good

Resistance to lodging: better than Abee; not equal to that of Condor

Resistance to straw breaking: good

Resistance to shattering: good

Disease reaction: CDC Richard has shown resistance to stem rust (*Puccinia graminis*) and scald (*Rhynchosporium secalis*), moderate resistance to common root rot (*Helminthosporium sativum*), moderate susceptibility to loose smut (*Ustilago nuda*), surface borne smuts (*U. hordei and U. nigra*) and the spot form of net blotch (*Drechslera teres*), and susceptibility to speckled leaf blotch (*Septoria passerinii*) and the net form of net blotch (*D. teres*).

Spike characteristics

Type: two-row

Shape: strap; dense; medium length

Attitude: semi-nodding

Lemma awns: rough; long; green tip

Lemma veins: glabrous; green

Glumes: half the length of the lemma; completely covered with short hair

Glume awns: length equal to length of glumes; smooth, purplish tip

Rachis: slightly tapered segments; curved internode; numerous short hair on spike rachis edges

Spike emergence: spike emerges above flag leaf

Kernel characteristics

Type: hull-less

Size: long and wide

Aleurone: yellow

Rachilla: medium length; medium length hairs; few abnormal rachilla

Basal marking: horseshoe depression

Protein content: intermediate

Quality: feed

Copies of this and related publications may be obtained from the Print Media Branch, Alberta Agriculture, 7000 - 113 Street, Edmonton, Alberta T6H 5T6 or Alberta Agriculture's District Offices.

Acceptable variants

1 hulled kernel per 1000 kernels in Breeder, Select and Foundation seed; 5 hulled kernels per 1000 in certified seed; some kernels with mottled blue areas at the brush end, or on the cheeks, may be produced under certain environmental conditions.

Performance

CDC Richard is a two-rowed hulless feed barley with a good combination of yield potential, threshability and scald and stem-rust resistance to allow it to be grown across the prairie region.

Maintenance of breeder seed

Crop Development Centre, University of Saskatchewan

Canadian distributor

SeCan Association

Recommended by

Prairie Registration Recommending Committee for Grain

Table 1. Grain yield (% of Abee) of CDC Richard and Abee, Western Co-operative Two-Row Trials, 1987-1989*

	Soil Type			
Variety	Black	Brown	Black & Grey	Overall
Abee	100	100	100	100**
CDC Richard	85	83	82	83

* Locations: Black Soil - Brandon, Glenlea, Indian Head, Melfort, Morden, Portage la Prairie, North Battleford
Brown Soil - Acme, Elrose, Irricana, Lethbridge, Regina Saskatoon, Scott, Swift Current, Watrous
Black & Grey Soil - Calmar, Lacombe, Olds 1, Olds 2, Provost

** Yield as % of Harrington; Actual overall grain yield for Harrington was 3300 kg/ha

Table 2. Agronomic characteristics of CDC Richard and Abee, Western Co-operative Two-Row Barley Trials, 1987-1989*

Variety	Days to head	Plant height (cm)	Lodging (1-9)**	Maturity (days)	1000 Kernel weight (g)	Test weight (kg/hl)	Plump kernels (%)
Abee	57.0	66.5	3.6	93.3	41.1	64.1	79
CDC Richard	55.7	70.7	4.6	92.5	39.0	73.1	59

* Locations: Black Soil - Brandon, Glenlea, Indian Head, Melfort, Morden, Portage la Prairie, North Battleford
Brown Soil - Acme, Elrose, Irricana, Lethbridge, Regina, Saskatoon, Scott, Swift Current, Watrous
Black & Grey Soil - Calmar, Lacombe, Olds 1, Olds 2, Provost

** 1-9; 1 = best

Table 3. Yield and agronomic characteristics of CDC Richard and check varieties, Hull-less Barley Co-operative Trials, 1988-1989*.

Variety	Yield (100's of kg/ha)	Days to head	Maturity (days)	Plant height (cm)	Lodging (1-9)	Kernel weight (g)	Combine-run test weight (kg/hl)	Cleaned test weight (kg/hl)	Viscosity (centi-stokes)	protein (%)	Beta-glucan (%)
Harrington	51.2	56.3	96.1	73	3.3	42.3	65.0	65.1	11.4	13.4	—
Scout	41.1	56.3	94.6	79	3.4	38.8	71.1	75.7	24.0	14.9	5.08
Condor	41.2	57.8	97.4	72	1.9	37.4	76.5	78.7	17.9	16.0	5.69
CDC Richard	43.2	55.5	98.0	78	3.3	40.0	75.4	77.5	8.9	14.2	4.46

* Locations: Beaverlodge, Brandon, Glenlea, Lacombe, Lethbridge, Olds, Goodale, Kernen, Trochu

Table 4. Yield and agronomic characteristics of CDC Richard and check varieties, Hulless Barley/Wheat Trials, 1987*

Variety	Grain Yield (100's of kg/ha)	Days to head	Maturity (days)	Lodging (1-9)**	Plant height (cm)	1000 Kernel weight (g)	Test weight (kg/hl)
Harrington	54.1	54.3	99.1	4.4	74	43.5	63.9
Scout	39.9	55.4	100.5	4.8	82	41.9	72.8
Condor	41.8	54.4	99.4	3.7	69	37.8	74.5
CDC Richard	47.3	53.7	96.5	6.1	74	41.2	75.5

* Locations: Beaverlodge, Brandon, Glenlea, Lacombe, Lethbridge, Goodale, Kerne

** 1-9; 1 = best

Table 5. Yield (as % of Tupper) of CDC Richard and Tupper, Manitoba Crop Adaptation Trials, 1989*.

	Manitoba Crop Zone					
Variety	1 & 2	3	4	5	6	Overall
Tupper	100	100	100	100	100	100**
CDC Richard	105	99	114	99	102	104

* Locations: Bagot, Beausejour, Brandon, Dauphin, Glenlea, Mariapolis, Melita, Portage la Prairie, Roblin, Shoal Lake, Swan River, Teulong, The Pas, Vita, Waskada, Winnipeg

** Actual overall grain yield for Tupper was 3211 kg/ha

Table 6. Disease reaction summary for CDC Richard and check varieties, 1987-1989 Two-Row Western Co-operative and 1989 Hull-less Barley Co-operative Trials*

	Stem Rust				Scald (Wpg., Inoc)			
Variety	**89HBC****	**87C**	**88C**	**89C**	**89HBC**	**87C**	**88C**	**89C**
Harrington	40MS-S	—	40MRMS	60MS-S	S	—	S	S
Scout	60MS-S	—	—	—	MS	—	—	—
Condor	30MRMS	30MRMS	—	—	MR	MS	—	—
CDC Richard	60MS	20MR	30MRMS	60MS-S	MR	R	R	R

	Septoria				Common Root Rot	
Variety	**89HBC**	**87C**	**88C**	**89C**	**87-89C Saskatoon**	**87-89C Scott**
Argyle	—	—	—	—	35	28
Harrington	S	S	S	S	—	—
Scout	S	S	S	S	—	—
Condor	S	S	S	S	—	—
CDC Richard	S	S	S	S	43	2E

	Scald (Field Ratings)				Net Blotch (Field Ratings)			
Variety	**88-89HBC**	**87C**	**88C**	**89C**	**88-89HBC**	**87C**	**99C**	**89C**
	(4)***	(1)	(3)	(1)	(4)	(1)	(2)	(1)
Harrington	6.5	—	6.2	9.0	7.3	—	7.4	6.5
Scout	5.9	—	—	—	7.0	—	—	—
Condor	5.6	3.0	—	—	6.5	8.0	—	—
CDC Richard	0.7	1.5	1.1	0.0	6.4	8.0	6.9	6.2

	Net Blotch (inoculated at Winnipeg)											
	Race 102				Race 858				Race 857			
Variety	**88HBC**	**87C**	**88C**	**89C**	**89HBC**	**87C**	**88C**	**89C**	**89HBC**	**87C**	**88C**	**89C**
Harrington	8	—	10	9	10	—	—	9	7	—	—	7
Scout	4	—	—	—	10	—	—	—	7	—	—	—
Condor	3	8	—	—	10	10	—	—	7	7	—	—
CDC Richard	7	10	8	10	10	10	10	10	7	7	7	7

	Smuts											
	U. nuda				U. hordei				U. nigra			
Variety	**88HBC**	**87C**	**88C**	**89C**	**89HBC**	**87C**	**88C**	**89C**	**89HBC**	**87C**	**88C**	**89C**
Harrington	93	—	80	66	32	—	33	25	15	—	17	16
Scout	46	—	—	—	32	—	—	—	20	—	—	—
Condor	71	58	—	—	32	23	—	—	11	5	—	—
CDC Richard	6	41	50	0	39	7	25	25	34	3	15	4

* 1987-89 locations: Acme, Brandon, Elrose, Glenlea, Indian Head, Irricana, Lacombe, Calmar, Lethbridge, Melfort, Morden, North Battleford, Olds 1, Olds 2, Portage La Prairie, Provost, Regina, Saskatoon, Scott, Swift Current, Watrous
1989 locations: Brandon, Beaverlodge, Glenlea, Lacombe, Lethbridge, Olds, Saskatoon, Goodale, Saskatoon KCRF, Trochu

** HBC = Hulless Barley Co-operative, C = 6-row Western Co-operative Trials

*** Number of stations of data

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